UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,896	03/06/2006	Peter Albersheim	102-02	9920

23713 7590 02/23/2007

GREENLEE WINNER AND SULLIVAN P C
4875 PEARL EAST CIRCLE
SUITE 200
BOULDER, CO 80301

EXAMINER	
KIM, TAEYOON	
ART UNIT	PAPER NUMBER
1651	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/553,896	ALBERSHEIM ET AL.	
	Examiner	Art Unit	
	Taeyoon Kim	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,22-25,28-32 and 34-46* is/are pending in the application.

4a) Of the above claim(s) *1-20, 20-25, 28-32 and 46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/10/06; 3/2/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-20, 22-25, 28-32 and 34-46 are pending.

Election/Restrictions

Applicant's election with traverse of Group IV (claims 34-42) and a species of "antimicrobial agent" in the reply filed on Jan. 24, 2007 is acknowledged. It is noted that applicant elected Group VI in the response. Since Group VI is not present in the list of Groups of inventions in restriction requirement by the office mailed on Oct. 24, 2006, and claims elected belong to Group IV invention, the examiner believes that applicant is meant to elect Group IV instead of Group VI. The traversal is on the ground(s) that 1) the international search on the corresponding PCT application (PCT/US04/11797) did not issue the lack of unity of invention, and 2) xyloglucan conjugates of the current invention functions as the special technical feature and represent a contribution over the prior art. This is not found persuasive because 1) it is not required that the international search should be the same as the national stage application, and 2) as discussed in the earlier office action that because of multiple methods disclosed in the current application, only **first appearing product** would be combined with **first appearing method of making**. Therefore, Group I (a method of making) and Group II (a product) are combined together. Since the technical feature shared by these two Groups is "xyloglucan conjugates" and the prior art referred in the previous office action teaches xyloglucan conjugates, there is no special technical feature between these two groups of invention. Thus, there is a lack of unity present between them. The rest of methods (method of making: Groups III and IV) are considered as each individual group of

invention. Applicant argues that xyloglucan conjugates of the current invention have functional groups including antimicrobial agent. Unity of invention has to be considered in the first place only in relation to the independent claims in an international application and not the dependent claims. By "dependent" claim is meant a claim which contains all the features of one or more other claims and contains a reference, preferably at the beginning, to the other claim or claims and then states the additional features claimed (PCT Rule 6.4). The limitation of functional group of antimicrobial agent is not disclosed in the independent claims of Group I and II inventions. Thus, the functional group of "antimicrobial agent" cannot be considered as a part of technical feature. Furthermore, since the technical feature in question is present between Group I and II, and applicant has elected Group IV invention which is not in question of lack of unity, the applicant's argument is moot.

The requirement is still deemed proper and is therefore made FINAL.

Claims 21, 26, 27 and 33 are cancelled, claims 1-20, 22-25, 28-32 and 34-46 are pending. Claims 1-20, 20-25, 28-32 and 46 have been withdrawn from consideration as being drawn to non-elected subject matter. Claims 34-45 have been considered on the merits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 34-36 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teeri et al. (US 2004/0091977).

Claims 34-36 and 39-41 are drawn to a method of attaching a functional group to cellulosic material comprising attaching one or more functional groups to xyloglucan polymers to form modified xyloglucan polymers, hydrolyzing the modified xyloglucan polymer to prepare a xyloglucan conjugate, and treating a cellulosic material with the xyloglucan conjugate (claim 34); a limitation to the functional group being a dye molecule (claim 35); a limitation to the xyloglucan conjugate comprising more than one functional group (claim 36); a limitation to the cellulosic material being cotton (claim 39); a limitation to the step of hydrolysis being carried out by enzymatic digestion (claim 40); a limitation to the enzymatic digestion being carried out by endoglucanase (claim 41).

Teeri et al. teach that xyloglucan polymers can be chemically and/or enzymatically modified to contain a wide range of different chemical groups and that

such chemically modified xyloglucan polymers can be used as an interface for introducing new chemical groups onto the cellulosic fiber surfaces (see paragraph 57). In detail, Teeri et al. teach a method of modifying polymeric carbohydrate materials such as cellulosic fiber (i.e. cotton, see paragraph 28) using a carbohydrate polymer fragments (or xyloglucan oligosaccharides or XGO) comprising a chemical group with functionality (i.e. an dye; see paragraph 34). The method of Teeri et al. teaches that XGO comprising a chemical group can be obtained by hydrolysis with endoglucanase (see Example 7).

Although Teeri et al. do not particularly teach the attachment of conjugates to xyloglucan polymer prior to the hydrolysis of the polymer to obtain xyloglucan conjugate, it would have been obvious for the person of ordinary skill in the art at the time the invention was made to attach a chemical group to xyloglucan polymer first and then hydrolyze xyloglucan polymer to obtain xyloglucan conjugate (carbohydrate linker molecule). M.P.E.P. § 2144 recites, "The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law...If the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court." In *In re Burhans, 154 F.2d 690, 69 USPQ 330* (CCPA 1946), the court found that selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. In *In re Gibson, 39 F.2d 975,*

5 USPQ 230 (CCPA 1930), the court found that selection of any order of mixing ingredients is *prima facie* obvious.

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Teeri et al. (US 2004/0091977) in view of Thurl et al. (1991).

Claim 42 is drawn to a limitation to the xyloglucan conjugate being purified by ultrafiltration (claim 42).

Teeri et al. teach the limitation of claim 34 (see above).

Although Teeri et al. do not teach the purification of xyloglucan conjugate being carried out by ultrafiltration, it would have been obvious for the person of ordinary skill in the art at the time the invention was made to use ultrafiltration as a technique to purify xyloglucan conjugates because ultrafiltration is well known in the art for purification of oligosaccharides as evidenced by Thurl et al. (1991; see Abstract).

The person of ordinary skill in the art would have had a reasonable expectation of success in using ultrafiltration in purification of carbohydrate polymer fragments (xyloglucan conjugates or XGO) since Thurl et al. successfully purify oligosaccharides using ultrafiltration.

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Claims 37, 38 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Teeri et al. (supra) in view of Gorbacheva et al. (US 4,407,748) and Barnabas et al. (US 6,613,733).

Claims are drawn to a limitation to the functional group being an antimicrobial agent (claim 37); a limitation to the dye molecule of claim 35 being an azo dye (claim 38); a limitation to the functional group in claim 34 being an antimicrobial agent (claim 43); a limitation to the xyloglucan conjugate in claim 36 comprising an antimicrobial agent (claim 44); a limitation to the xyloglucan conjugate of claim 44 comprising a dye (claim 45).

Teeri et al. teach the limitations of the method in claim 34 (see above).

Teeri et al. do not teach that the functional group attached to the xyloglucan polymers being an azo dye or an antimicrobial agent.

Gorbacheva et al. teach an azo dye molecule, which has an antimicrobial activity, impregnated by chemical bonding to the fiber-forming polymers (see Abstract and column 1, lines 25-29).

It would therefore have been obvious for the person of ordinary skill in the art at the time the invention was made to use the azo dye molecule having an antimicrobial activity as a functional group attached to the xyloglucan polymers in the method of Teeri et al.

The skilled artisan would have been motivated to make such a modification because since it is well known that textile materials such as cellulosic fiber (cotton; see Example 1) undergo biological degradation due to microorganisms, and also taught by

Gorbacheva et al., the use of materials having antimicrobial properties makes it possible to extend the life of the materials (see column 1, lines 15-24). In addition, the use of dye in textile/clothes materials such as cottons is notoriously well known in the art.

The person of ordinary skill in the art would have had a reasonable expectation of success in using the azo dye material having antimicrobial activity taught by Gorbacheva et al. because this molecule has been used as a functional group attached to textile material such as cotton (see Example 1 of Gorbacheva et al.).

Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill at the time the invention was made.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taeyoon Kim whose telephone number is 571-272-9041. The examiner can normally be reached on 8:00 am - 4:30 pm ET (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Taeyoon Kim
Patent Examiner
Art Unit 1651

Leon B Lankford, Jr
Primary Examiner
Art Unit 1651